



ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

595 SOUTH STATE STREET, ELGIN, ILLINOIS 60123

THOMAS V. SKINNER, DIRECTOR

847-608-3131

FAX: 847-608-3139

June 5, 2000

Crystal Clear Water Company
c/o Thomas P. Mathews, President
7314 Hancock Drive
Wonder Lake, Illinois 60097

Re: **Crystal Clear Water Company - 111-5150**
May 16, 2000 Inspection Report

OFFICIAL FILE

I.C.C. DOCKET NO. 01-0488 et alAWC Exhibit No. MLJ 7

Witness _____

Date 4-14-03 Reporter B

Dear Mr. Mathews:

An engineering evaluation of the **Crystal Clear Water Company** community water supply has been completed. Field inspection was made on May 16, 2000, by Mr. Chris Johnston and Mr. Manny Abad of this office. Mr. T. P. Mathews, President and Mr. Jeff Claus, Vice President were present during this inspection.

The Illinois Environmental Protection Agency conducts periodic evaluations of all community water supplies to determine if their ongoing programs for monitoring, maintaining the water supply, and providing appropriate information to the water users meet the requirements of the Illinois Pollution Control Board's public water supply regulations and related standards. The reason for this work is that if the people in a community are to cooperate and use a common water supply, they must feel that their system is properly constructed, operated and maintained.

Our inspection identified aspects of the water system that may not comply with current standards or regulatory requirements. These items are detailed in attachment "A" of this letter.

Please respond to these findings in writing within 45 days. Your response should describe the steps that have been, or will be taken to correct these deficiencies. You may request additional time to respond by calling this office at 847-608-3131.

I also request that you review the enclosed "Public Water Supply Data Sheets". Monitoring requirements are determined by the information included on these data sheets, making it vital that you inform us of any errors or other inaccuracies.

Crystal Clear Water Company - 111-5150
June 5, 2000

I appreciate the cooperation and courtesy extended during this survey. If you have questions or comments regarding this evaluation, do not hesitate to contact this office at (847)-608-3131.

Very truly yours,



John J. Dalessandro
Senior Public Service Administrator
Division of Public Water Supplies
Illinois Environmental Protection Agency



Chris Johnston
Environmental Engineer

cc: McHenry County Health Department
Illinois Commerce Commission
Mr. Jeff Claus, Vice President
Julie Janssen, IDPH-DDH
State Water Survey

ATTACHMENT "A" VIOLATIONS, DEFICIENCIES AND RECOMMENDATIONS

1. The reported population is 1,015. Due to the increase in population, the water system must immediately begin collecting a minimum of two (2) distribution samples for coliform analysis (35 IL. Adm. Code, Section 611, TABLE A).
2. Well #1 (ID 20145) has a capacity of 25 gallons per minute (gpm). The average daily water use in 1999 was 79,439 gallons per day, which is equal to 55 gpm. If well #2 were to fail, well #1 would be unable to meet average daily demand. The total developed groundwater source capacity must equal or exceed the average day demand with the largest producing well out of service. Either rehabilitate well #1 such that it can provide at least 55 gpm, construct a third well, or obtain an interconnection with a neighboring public water supply, in accordance with 35 IL. Adm. Code Section 653.106 and Section 3.2.1.1 of the *Recommended Standards for Water Works*. Please note that any of these improvements require a construction permit. In the interim, if well #2 should fail, issue a boil-order in accordance with 35 IL. Adm. Code, Section 607.103.
3. The supply is adding phosphate to the raw water from Well #1 (ID 20145 - TAP 01) and Well #2 (ID 20146 - TAP 02). Please submit copies of the IEPA construction and operating permits for this improvement. If a construction permit was not obtained, submit "As-Built" plans to our Springfield Permit Office (1-217-782-1724) and obtain an "As-Built" permit (35 IL. Adm. Code, Section 602.116).
4. The water system is on the Agency's "Restricted Status List" due to insufficient hydropneumatic storage capacity. Community water systems using hydropneumatic pressure tanks must have a total storage capacity exceeding 35 gallons per person. Storage for the facility consists of an 8,000 gallon hydropneumatic tank and a 20,000 gallon hydropneumatic tank, for a total storage capacity of 28,000 gallons. The hydropneumatic storage capacity is deficient by 7,525 gallons (35 gallons x 1,015 residents = 35,525 gallons). *The Agency has recommended increasing the hydropneumatic storage capacity since May 9, 1988.*

In addition, Section 7.2 of the *Recommended Standards for Water Works* states that hydropneumatic storage is acceptable only in very small water systems. Systems having more than 150 service connections should use ground or elevated storage facilities. The water system has 295 service connections, which is nearly twice the limit specified by the

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standards.

The water system must comply with one of the following options:

- A. Replace the hydropneumatic storage with an elevated tank meeting the requirements of **Section 7.0.1 of the *Recommended Standards for Water Works***.
 - B. Obtain a metered connection from another Public Water Supply with an automatic valve that will allow water to enter the supply's lines whenever water pressure drops below 25 psi.
 - C. Install a ground storage facility equal to 1.5 x average daily use, pumps and an emergency generator in accordance with **35 IAC Section 653.110**.
5. The water system has no auxiliary power supply to maintain water pressure during a power outage. Auxiliary generators capable of operating well pumps and chemical treatment pumps or connections to at least two independent power sources are necessary to provide water pressure during a power outage. At the time of inspection it was reported the supply has portable generators; However, since the supply utilizes hydropneumatic storage, the system will quickly lose pressure before the generators could be connected (in addition to the fact the supply does not have any automatic system alarms). Provide dedicated auxiliary power as required by **Sections 2.6 and 3.2.1.3 of the *Recommended Standards for Water Works*** (note: If an auxiliary generator is installed, see *Recommended Standards for Water Works* for protection of the water supply from fuel storage or fuel line location).
 6. Illinois Commerce Commission flow tests have shown pressure at certain hydrants falls below 20 psi when opened. Distribution systems shall be designed to maintain a minimum pressure of 20 psi measured at the ground surface in all parts of the system under fire-fighting demand or other similar emergency operating conditions. Please notify this office (1-847-608-3131) and issue a boil-order if distribution pressure drops below 20 psi, in accordance with **35 IL. Adm. Code, Sections 607.103, 653.106, and 653.303**. An answering machine is operational during non-working hours. Any future design of the system should take these flow tests into account.
 7. The facility has "flush valves," (gate valves on the end of uncapped water mains) that discharge below ground. These are cross-connections, since water remaining in the portion of the main behind the gate valve will be unpotable.

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At all locations where these "flush valves" are located, install flushing devices which discharge above the ground surface and provide a velocity of at least 2.5 feet per second in the water main being flushed, in accordance with **35 IL. Adm. Code Section 607.104** and **Section 8.1.6 of the *Recommended Standards for Water Works***.

8. At the time of inspection the roof to the wellhouse was damaged (with visible holes), and was leaking. Water which enters the wellhouse through the roof could damage the electrical system and increase corrosion of the hydropneumatic tanks. In addition, leaking water may contaminate treatment chemicals, and pose a hazard to personnel entering or working in the wellhouse. Repair the roof such that it is water tight and structurally sound, in accordance with **Section 5.0.2 of the *Recommended Standards for Water Works***.
9. The annular opening at the top of the casing for well #1 (ID 20145), where electrical wires enter the well, is not tightly sealed. This opening could allow dust, dirt, insects, etc. to enter the well and contaminate the water supply. Tightly seal the annular opening at the top of the casing in accordance with **Section 3.2.7.4 of the *Recommended Standards for Water Works***.
10. The following wells do not have air lines or other ways of measuring / monitoring water levels:
 - A. Well #1 (ID 20145):
 - B. Well #2 (ID 20146).

The level of water in a well can decline because of over pumping, seasonal variation, or changes to the aquifer's characteristics. Since rapid changes rarely occur, records of the water level in a well can be used to anticipate problems before they create a hardship on the community. Install air lines or other ways of measuring / monitoring the water levels at well #1 and well #2, in accordance with **Section 3.2.7.6 of the *Recommended Standards for Water Works***. Once air lines are installed, the supply should test the static water levels and pumping water levels at least once a month and report these values on the daily operating reports.
11. At the time of inspection the chlorine residual in the phosphate solution was unknown. Please note that stock phosphate solution must be disinfected by carrying 10 milligrams per liter (mg/L) free chlorine residual. This is necessary to prevent bacterial or other

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growths developing in the solution. Maintain a free chlorine residual of at least 10 mg/L in the phosphate solution as required by **35 IL. Adm. Code Section 653.202 and Section 4.6.5 of the *Recommended Standards for Water Works*.**

12. Some of the water main for the facility is located in the back yards of homes. The community is served by septic systems. Please note that water main must be separated from septic tanks, disposal fields and seepage beds by a minimum of 25 feet, in accordance with **35 IL. Adm. Code, Section 653.119.**
13. To maintain fluoride levels between 0.9 milligrams per liter (mg/L) and 1.2 mg/L, the supply is blending the raw water from well #1 and well #2 in the hydropneumatic tanks. In the last 12 months, *nine* samples have shown levels both above and below the 0.9 mg/L to 1.2 mg/L range. In order to maintain the required fluoride concentration, either modify the controls for both wells such that *they only operate together* (which should theoretically result in a fluoride level of 1.4 mg/L), or connect and maintain the fluoride feed to well #2. In addition, the operator's tested results show an average 0.3 mg/L discrepancy from the Laboratory tested results. The fluoride test kit must be either correctly calibrated or replaced with an Agency approved model (**35 IL. Adm. Code, Sections 611.125, 653.501, and 653.701, and Act 40/7a. of the Illinois Compiled Statutes**).
14. The following dead-ends do not have flushing devices:
 - A. The west end of Claire Street.
 - B. The south end of Oak Street.

All dead-end water main must be provided with a flushing device. This will allow operating personnel to flush the system after repairs, effectively remove iron and manganese oxides which settle and build-up in the main, and to remove any stagnant water. Install flushing devices which discharge above grade and can produce flow velocities of at least 2.5 feet per second in the water main being flushed, in accordance with **Section 8.1.6 of the *Recommended Standards for Water Works***. Please note that fire hydrants, or hydrants with 4-1/2 inch pumper nozzles, are not allowed on systems with hydropneumatic storage (**Sections 7.2 and 8.1.5 of the *Recommended Standards for Water Works***).

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15. The following refers to permits:

- A. Please note, in accordance with **35 IL. Adm. Code, Sections 652.101 and 653.115**, construction permits shall be obtained by the official custodian of a community water supply prior to all alterations, changes or additions to an existing community water supply which may affect the sanitary quality, mineral quality or adequacy of the supply. This includes: *replacement of well pumps which have become inoperable*, replacement of water main, and the installation or relocation of all treatment chemicals. Please call our permit section at 1-217-782-1724 with any questions.
- B. Please note the Agency may issue construction and operating permits by telephone (1-217-782-1724), in accordance with **35 IL. Adm. Code, Sections 652.301 and 602.104**, if emergency conditions exist which threaten the safety or adequacy of the water supply.

16. The supply submitted all of the daily operating reports for each month of 1999 in May 2000. Please note that daily operating reports must be submitted *monthly*. Submit copies of the daily operating reports within 30 days of the end of each month, in accordance with **35 IL. Adm. Code 653.605**. *The Agency has requested the water system to submit copies of the daily operating records on a monthly basis since January 13, 1992.*

RECOMMENDATIONS AND SUGGESTIONS:

17. The supply has no low water or power outage alarms. Currently, users notify the supply when pressure is low (lost). By the time pressure has dropped enough to be noticed by users, an emergency situation will have already developed. Alarms should be installed to inform the operator of low water and power outage situations *before* emergency situations develop. In addition, the supply should thoroughly investigate all low pressure problems as they occur.

COMMENDATIONS:

18. The facility is commended on the updating of its' electrical system, and the courtesy of its' employees.

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Illinois Environmental Protection Agency

Bureau of Water - Division of Public Water Supplies

Inspection Report - Elgin Regional Office

FACILITY NAME	Crystal Clear Water Company			FACILITY NUMBER	111-5150		
PLANT PHONE	1-815-653-2961			COUNTY	McHenry		
INSPECTION DATE	May 16, 2000			INSPECTED BY:	Chris Johnston and Manny Abad		
SEND CORRESPONDENCE TO				EXEMPTION / LABORATORY FEE STATUS			
NAME OR ENTITY	Thomas P. Mathews			CHLORINE (Date)	Not exempt.		
ADDRESS	P.O. Box 189			CERTIFIED OPERATOR (Date)	Not exempt.		
CITY, STATE, ZIP	Wonder Lake, IL 60097			LAB FEE PARTICIPANT (Y/N)	No		
CONTACT INFORMATION							
CERTIFIED OPERATOR	Thomas P. Mathews			CLASS	"C"	NUMBER	00956
PHONE	1-815-653-2961			FAX	1-815-653-2081		
PORTABLE PHONE	1-815-482-1401			OTHER	Home: 1-815-653-7171		
OWNER - RESPONSIBLE PERSONNEL	Thomas P. Mathews			TITLE OR POSITION		President	
PHONE	1-815-653-2961			FAX	1-815-653-2081		
OTHER CONTACTS	NAME		TITLE OR POSITION		PHONE		
	Mr. Jeff Claus		Vice President		1-815-653-2961		
	Mrs. Evelyn Raske		Office Manager		1-815-653-2961		
HOME PAGE ADDRESS	None						
FACILITY STATUS							
Open		Critical Review		Restricted Status	X	Reason	Insufficient hydropneumatic storage capacity
						Date	05/27/1988
SERVICE CONNECTIONS						# METERS	
NUMBER OF DIRECT SERVICES						295	295
DIRECT SERVICES OUTSIDE CORPORATE LIMITS						None	--
Residential Customers						290	290
Commercial Customers						5	5
Industrial Customers						0	0
SATELLITE WATER SYSTEMS / INTERCONNECTIONS						FACILITY NUMBER	Source? Customer?
None.						N/A	--- ---
ADEQUACY OF SUPPLY							
DATE RANGE	FROM	Jan.	TO	Dec.	PLANT CAPACITY (MGD)	0.16848 MGD	
LIMITING FACTOR FOR PLANT CAPACITY?						Combined capacities of well #1 and well #2.	
ANNUAL PUMPAGE (MG)	RAW	?			FINISHED	29.0301 MG	
AVERAGE DAILY (MGD)	RAW	?			FINISHED	0.079439 MGD	
MAX 7 Day Average (MGD)	RAW	?			FINISHED	0.121714 MGD	
Historical MAX 7-Day Average (MGD)	RAW	?			FINISHED	0.121714 MGD	
POPULATION	1,015	Estimated or Census Data				Estimated	
	How was Estimated Population Figured?						3.5 people per connection
AVERAGE DAILY PER CAPITA USAGE	78 gpp/pd (low)	Time to Produce Average Daily (Finished)				11.3 hours	
		Time to Produce MAX 7- Day Average (Finished)				17.3 hours	

BRIEF DESCRIPTION OF SYSTEM AND SERVICE AREA

The Crystal Clear Water Company (111-5150) is located in southeast McHenry County, southeast of Crystal Lake (111-0150), and southwest of the intersection of Routes 31 and 14. The Public Water Supply consists of two shallow wells, hydropneumatic storage, and one pressure system. Both wells are active. The facility has two active TAP's (TAP's 01 and 02).

TAP 01 receives water from well #1, which operates automatically and supplements the production of well #2. Well #1 (ID 20145, rated 25 gpm @ 115 feet TDH) was drilled to a depth of 512 feet in 1954, tapping a dolomite and shale aquifer. The raw water is treated with polyphosphate (WSU 319 diluted 50%) and disinfected with sodium hypochlorite (12.5% diluted 50%). Well #1 has a hardness concentration of 122 mg/L as CaCO_3 , an alkalinity concentration of 408 mg/L as CaCO_3 , an iron concentration of 0 mg/L, and a natural fluoride concentration of 4.5 mg/L. Well #1 exceeds the fluoride MCL. Well #1 appears to have an unusually low iron concentration, and it was reported the water from well #1 contains hydrogen sulfide.

TAP 02 receives water from well #2, the "primary" well. Well #2 (ID 20146, rated 92 gpm @ 115 feet TDH) was drilled to a depth of 271 feet in 1961, tapping a sand and gravel aquifer. The raw water is treated with polyphosphate (WSU 319 diluted 50%) for iron sequestration, has the capacity to be supplementally fluoridated with hydrofluosilicic acid (23% diluted to a 2.3% solution), and disinfected with sodium hypochlorite (12.5% diluted 50%). Well #2 has an iron concentration of 0.38 mg/L, a manganese concentration of 0.02 mg/L, a hardness concentration of 311 mg/L as CaCO_3 , and a natural fluoride concentration of 0.58 mg/L. At the time of inspection the fluoride feed was not connected.

After treatment the water from well #1 passes through an 8,000 gallon hydropneumatic tank and a 20,000 gallon hydropneumatic tank before entering the distribution system. After treatment the water from well #2 passes through the 20,000 gallon hydropneumatic tank before entering the distribution system. When both wells are operating mixing can occur in the 20,000 gallon tank which should theoretically result in a 1.42 mg/L fluoride dose; however, the wells operate independently. In the last 12 months nine monthly fluoride tests have been out of the 0.9 mg/L to 1.2 mg/L range.

The water company has had a history of late sample results, not maintaining proper fluoride residuals, and numerous complaints for not issuing boil-orders, water shut-offs without notice, rusty water, black water, water with strange odors, and low pressure. The facility is under enforcement. If well #2 fails to operate, well #1 cannot meet demand. The supply has had numerous power outages primarily caused by shorts at or near the wellhouse. Storage consists of a 20,000 gallon hydropneumatic tank and a 8,000 gallon hydropneumatic tank. The facility is on restricted status for insufficient hydropneumatic storage. The distribution system consists of 7,481 feet of 4-inch, 5,375 feet of 6-inch, and 450 feet of 8-inch cast iron main. "Flush" valves exist in the distribution system. These "flushing devices" consist of underground gate valves, behind which is a short stretch of main that is not capped. Hydrant tests by the ICC show flow pressures fall below 20 psi at some locations. No emergency power is provided for the supply. The facility does not have any system alarms. The community is served by septic systems. A free chlorine residual of 0.2 mg/L was measured in the distribution system on the day of inspection.

TREATMENT APPLICATION POINT SUMMARY											
TAP #	Location or Description	Source Name	Source ID	Status (A, I or X)	Well Depth	Casing Length	Aquifer	Current Production (GPM)	GWUDI Eval. (DATE)	Waivers	
										VOC	SOC
01	Wellhouse at 4910 Drive in Lane	Well #1	20145	A	512 feet	271 feet	Dolomite and Shale	25 gpm at 115 feet TDH and 15 HP	Never submitted information	*Not approved	*Not Approved
Source Use (Disconnected sources, backups, seasonal use, etc)		One of two sources of water. Well #1 supplements the production of well #2, and operates automatically.									
Bacteriological History (Raw water samples)		No coliform detections in the last 12 months; however, in the last five years well #1 has had periodic "countable" colony detections, TNTC detections, and total coliform detections.									
TREATMENT		Disinfectant Used		Fluoridation Chemical Used		Other Chemical Addition		Well Inorganic Statistics:			
		Sodium hypochlorite (12.5% diluted 50%)		None - natural. Facility claims water from the two wells is blended in the hydropneumatic tanks. The wells do not operate together.		Polyphosphate - (WSU 319 diluted 50%).		Iron conc.: 0 Mg/L Manganese conc.: 0 Mg/L Hardness as CaCO ₃ : 122 Mg/L Alkalinity CaCO ₃ : 408 Mg/L pH: 7.82 Natural Fluoride conc.: 4.5 Mg/L			
		Installation Deficiencies						General Condition of Plant			
		1. The annular opening at the top of the casing (where the electrical wires enter well #1) is not tightly sealed; well #1 does not have a pressure gauge, well #1 does not have an airline or other means to measure water levels, and the casing vent for well #1 does not have a screen. 2. No auxiliary power. 3. The fluoride, phosphate, and chlorine day tanks do not have protective curbing nor containment. 4. The phosphate solution may not have a 10 mg/L free chlorine residual. 5. The wellhouse roof is leaking.						Fair.			
Other Comments regarding this TAP		*Vulnerability waivers were not approved because the well is within 1,000 feet of the "Vulcan" gravel pit. Well #1 has an unusually low iron concentration, and an unusually high natural fluoride concentration. It was reported the water from well #1 contains hydrogen sulfide.						Emergency Power		None.	

TREATMENT APPLICATION POINT SUMMARY											
TAP #	Location or Description	Source Name	Source ID	Status (A, I or X)	Well Depth	Casing Length	Aquifer	Current Production (GPM)	GWUDI Eval. (DATE)	Waivers	
										VOC	SOC
02	Just north of the wellhouse at 4910 Drive In Lane	Well #2	20146	A	271 feet	263 feet	Sand & Gravel	92 gpm @ 115 feet TDH and 20 HP	Never submitted info.	*Not approved	*Not approved
Source Use (Disconnected sources, backups, seasonal use, etc.)		Main source of water for the supply.									
Bacteriological History (Raw water samples)		No detections during the last 12 months.									
TREATMENT		Disinfectant Used	Fluoridation Chemical Used	Other Chemical Addition		Well Inorganic Statistics:					
		Sodium hypochlorite (12.5% diluted 50%)	Hydrofluosilicic acid (23% diluted to a 2.3% solution). Not on-line at the time of inspection. Facility claims water from the two wells is blended in the hydropneumatic tanks. The wells do not operate together.	Polyphosphate - (WSU 319 diluted 50%).		Iron conc.: 0.38 Mg/L Manganese con 0.02 Mg/L Hardness as CaCO ₃ : 311 Mg/L pH: 7.7 Natural Fluoride conc.: 0.58 Mg/L					
		Installation Deficiencies					General Condition of Plant				
		1. Well #2 does not have a pressure gauge, and well #2 does not have an airline or other means to measure water levels. 2. No auxiliary power. 3. The fluoride, phosphate, and chlorine day tanks do not have protective curbing nor containment. 4. The phosphate solution may not have a 10 mg/L free chlorine residual. 5. The wellhouse roof is leaking.					Fair.				
Other Comments regarding this TAP		*Vulnerability waivers were not approved because the well is within 1,000 feet of the "Vulcan" gravel pit.						Emergency Power		None.	

Service Area / Pressure Zone / Distribution System											
Water Source(s)				TAP 01/Well #1 and TAP 02/Well #2							
Location or Description				Service Area Population		No. of Service Connections		Finished Water Storage (Show Capacities)			
								Ground	Elevated	Hydropneumatic	
Entire distribution system.				1,015		295		---	---	8,000 gallons	
								---	---	20,000 gallons	
Maximum System Pressure		Location		Minimum System Pressure		Location		Free Chlorine Residual (mg/l)		Location	
60 psi		Wellhouse		45 psi		Minimum pressure switch setting (the minimum distribution pressure is unknown)		0.2 mg/L		Distribution	
Flushing Program				Fire Protection Provided?		Current Map Available?		Valve Maintenance Program			Notes and Other Observations
None	Yearly	2 x year	More Often	No	Yes	No	Yes	No Valves	No Program	OK	
			Monthly during non-freezing weather	X			X			X	The distribution system consists of 7,481 feet of 4-inch, 5,375 feet of 6-inch, and 450 feet of 8-inch cast iron main. The 8,000 gallon hydropneumatic tank does not have a sight glass. Both tanks are in poor condition and need maintenance inside and out. "Flush" valves exist in the distribution system. These "flushing devices" consist of underground gate valves, behind which is a short stretch of main that is not capped. Two deadends do not have flushing devices.

Hydrant locations with flow pressure below 20 psi - ICC Hydrant Inspection Report for October 1998				
Hydrant Number	Location	Static Pressure	Flow Pressure	Gallons per minute
1	?	50 psi	6 psi	450 gpm
6	Three Oaks Rd. & Redwood St.	50 psi	13 psi	550 gpm
4	Colonial St. & Rose St.	60 psi	15 psi	530 gpm
3	Cowlin St. & Colonial St.	40 psi	7 psi	370 gpm
2	Manor Rd. & Rt. 14	40 psi	12 psi	530 gpm

Operating Reports / Records															
Monthly Reports Being Submitted?			Content of Monthly Reports												
			Report for each TAP?		Daily Production from Each Well?		Daily Measured Residuals?		Daily Dosage Calculations?		Notes and Other Observations				
			Yes	No	Yes	No	Yes	No	Yes	No					
X			X		X		*X		*X		*The facility has a habit of sending all monthly reports for a given year at once.				
Cross Connection control Ordinance															
Does the system have an ordinance?		Date Approved (by IEPA)		Program Enforced?		Do Private Wells Exist in the Service Area?									
Yes	No			Yes	No	Yes		No							
X		11/18/1994		X				X							
Monitoring															
Bacteriological Summary															
Monitoring History (Last 12 Months)				Primary Lab		Phone		FAX							
	Raw	Finished	Distribution												
Number of Samples	24	0	15	McHenry Analytical		1-815-344-4044		1-815-344-2208							
Number Satisfactory	24	0	15	Secondary Lab		Phone		FAX							
Number Invalid	0	0	0												
Number Unsatisfactory	0	0	0	None		N/A		N/A							
Fecal / E. Coli. Positive	0	0	0	Coliform Monitoring Plan Approved?		All Major Portions of system included in Plan?		Chlorine Residuals taken at Sample Sites?		Monitoring FREE Residual?					
				Yes	No	Yes	No	Yes	No	Yes	No				
Monitoring Violations	0	MCL Violations	0	X		X		X		X	X				
Fluoridation Summary (Last 12 months)															
TAP No	No. of Samples	Minimum (mg/l)	Maximum (mg/l)	Average	Violations (list months)		Notes and Observations (Fluoridation)								
01	None	N/A	N/A	N/A	N/A		Excessive (4.5 mg/L) natural fluoride								
02	?	?	?	?	?		Could not find results.								
Dist.	12	0.78 mg/L	2.37 mg/L	1.62 mg/L	12/99, 11/99, 10/99, 09/99, 06/99, 04/99, 03/99, 02/99, 01/99		The supply has had a history of not being able to maintain the fluoride dose in the required range. The lab versus operator test results show an average discrepancy of 0.3 mg/L. At the time inspection the fluoride feed was not connected, and the supply claimed water from the two wells was blended in the hypopneumatic tanks. The wells do not always operate together.								
Viability / Financial Management															
Service Fee (Minimum Charge)		\$6.00 a month		Other source(s) of income used to maintain the water system				None							
Direct Charge (cost per 1,000 gallons)		\$1.56		How does the utility handle customers who fail to pay water bills?				Notice protocol and if necessary disconnection							
Billing Frequency		Bi-monthly		Does the utility have a fund to cover major repairs?				No							
ICC Regulated? (Y/N)		Yes		Name and phone no. of person responsible for system repairs.				Mr. T.P. Mathews 1-815-653-2961							
Date of Last Rate Increase		June 1999													

PWS Basic Facility Characteristics Change Form

Facility Number: **111-5150** Facility Name: **Crystal Clear Water Company**

Effective Date: **ASAP**

Current Record		Change To
	No. of Service Connections	295
	Population Served*	1,015
	Coliform Samples (RAW)	2 Well #1 - ID 20145 Well #2 - ID 20146
	Coliform Samples (FINISHED)	0
	Coliform Samples (Distribution)	2
	No. of Fluoride Bottles to be sent☆	0
	List TAP No(s) to be monitored for Fluoride	TAP 02
	No. of Coliform Bottles to be Sent	4
	Bottle Recipient Address	Crystal Clear Water Company P.O. Box 189 7314 Hancock Drive Wonder Lake, IL 60097

* Basis of Population and/or Service Connection Change (i.e., 100 homes X 3 People):

☆ Complete only if Participant in Lab Fee program and Supply Requests use of IEPA laboratory for analysis.

⊗ Address must be useable for both US Mail and UPS delivery. If Necessary, List Both.

DATE: June 8, 2000

IEPA Personnel: Chris Johnston and Manny Abad

Mail completed form to Marilyn Turner, IEPA/BOW/CAS/#19, Springfield, IL 62794-9276

FYI - Answers to Commonly Asked Questions

The number of distribution samples required is determined by the population served by the water system (35 IL. Adm. Code 611, Table A). Additional distribution samples may be required by IEPA to accommodate separate distribution systems.

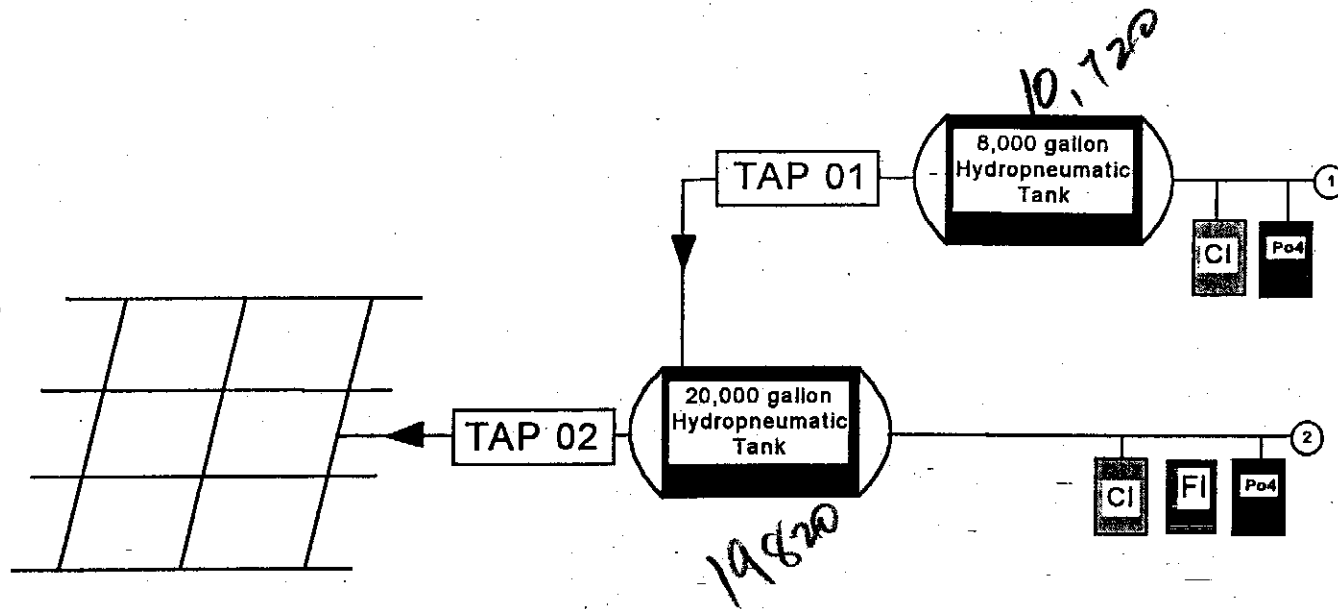
Raw samples are required for systems that add a disinfectant, since problems with the wells or treatment processes may not be detected by distribution samples.

Backup wells that are not in routine use should be monitored quarterly. If an unmonitored well must be used, a boil order must be issued.

Water samples that are invalidated by the laboratory cannot be used for compliance. Invalid water samples must be replaced to avoid a monitoring violation.

REPEAT sampling must be provided for ALL distribution samples found to contain coliform bacteria. Repeat sampling consists of three additional samples. One of the three samples should be taken from the location giving the original positive result. A second sample must be collected from an UPSTREAM location that is within 5 service connections, and the third sample taken from a DOWNSTREAM location, that is also within 5 service connections of the original sample point. If repeat samples are not collected, IEPA must "credit" the water system with three additional positive results.

**Crystal Clear Water Company
McHenry County - 111-5150**



Well #1
ID 20145
Status: Active
Capacity: 25 gpm
Aquifer: Dolomite/Shale

Well #2
ID 20146
Status: Active
Capacity: 92 gpm
Aquifer: Sand & Gravel

Colors in accordance with Recommended
Standards for Water Works, Section 2.14

a:\coreflow\111-5150.cfl

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

595 SOUTH STATE STREET, ELGIN, ILLINOIS 60123

THOMAS V. SKINNER, DIRECTOR

847-608-3131

FAX: 847-608-3139

June 13, 2000

McHenry Shores Water Company
c/o Mr. Thomas P. Mathews, President
7314 Hancock Drive
Wonder Lake, Illinois 60097

Re: **McHenry Shores Water Company - 111-5020**
May 30, 2000 Inspection Report

Dear Mr. Mathews:

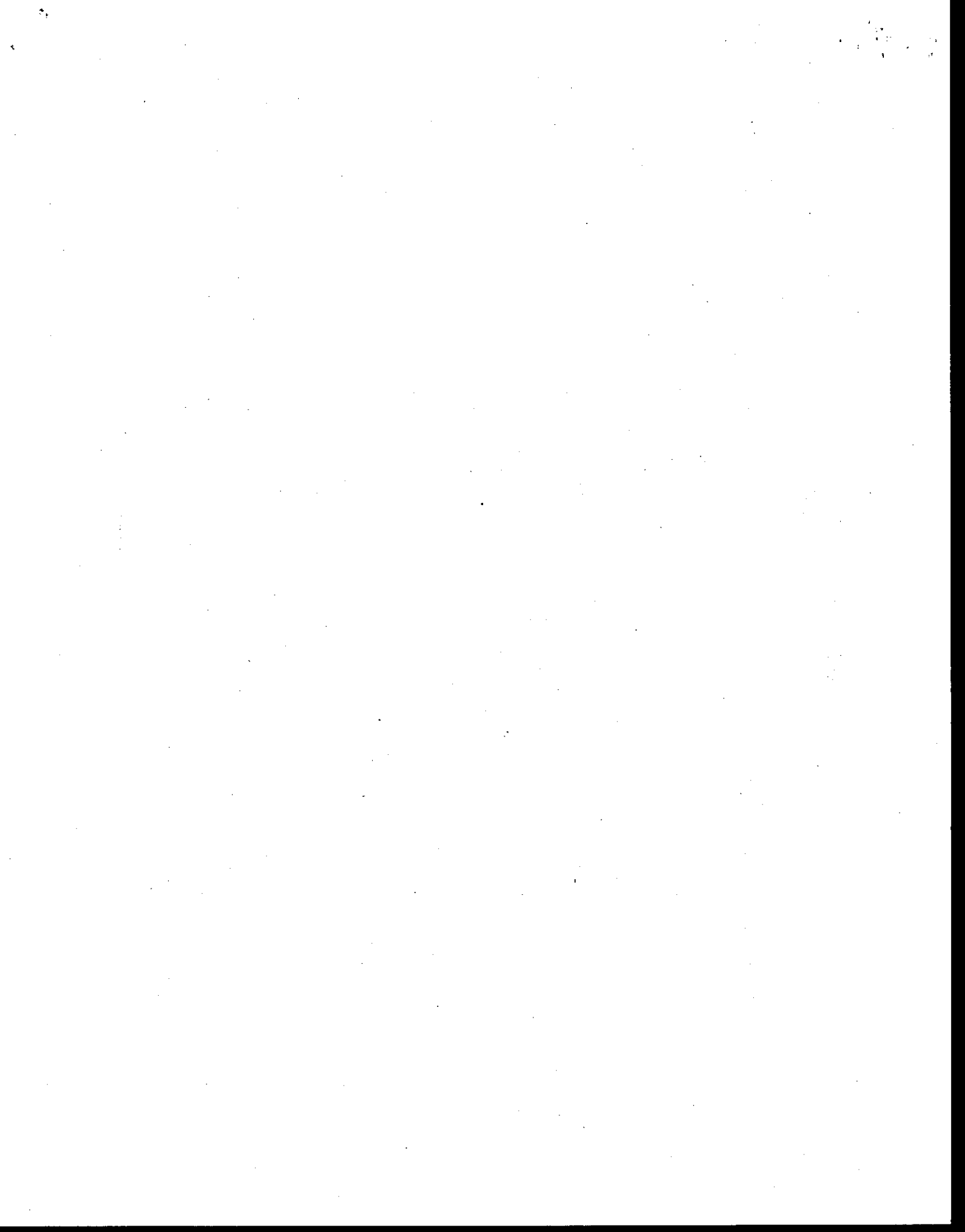
An engineering evaluation of the **McHenry Shores Water Company** community water supply has been completed. Field inspection was made on May 30, 2000, by Mr. Chris Johnston and Mr. Manny Abad of this office. Mr. T. P. Mathews, President and Mr. Jeff Claus, Vice President were present during this inspection.

The Illinois Environmental Protection Agency conducts periodic evaluations of all community water supplies to determine if their ongoing programs for monitoring, maintaining the water supply, and providing appropriate information to the water users meet the requirements of the Illinois Pollution Control Board's public water supply regulations and related standards. The reason for this work is that if the people in a community are to cooperate and use a common water supply, they must feel that their system is properly constructed, operated and maintained.

Our inspection identified aspects of the water system that may not comply with current standards or regulatory requirements. These items are detailed in attachment "A" of this letter.

Please respond to these findings in writing within 45 days. Your response should describe the steps that have been, or will be taken to correct these deficiencies. You may request additional time to respond by calling this office at 847-608-3131.

I also request that you review the enclosed "Public Water Supply Data Sheets". Monitoring requirements are determined by the information included on these data sheets, making it vital that you inform us of any errors or other inaccuracies.



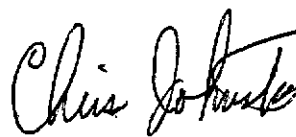
McHenry Shores Water Company - 111-5020
June 13, 2000

I appreciate the cooperation and courtesy extended during this survey. If you have questions or comments regarding this evaluation, do not hesitate to contact this office at (847)-608-3131.

Very truly yours,



John J. Dalessandro
Senior Public Service Administrator,
Division of Public Water Supplies
Illinois Environmental Protection Agency



Chris Johnston
Environmental Engineer

cc: McHenry County Health Department
Illinois Commerce Commission
~~Mr. Jeff Claus, Vice President~~
Julie Janssen, IDPH-DDH
State Water Survey

ATTACHMENT "A" VIOLATIONS, DEFICIENCIES AND RECOMMENDATIONS

VIOLATIONS OF CURRENT CONSTRUCTION STANDARDS:

1. Well #3 (ID 01145) was constructed with IEPA emergency construction permit 2196-FY1995. In accordance with **35 IL. Adm. Code 602.104**, approval of "As-Built" plans are required for the permit to be issued. On August 8, 1995, Mr. Dave Cook of our Permit Office submitted a project review letter to your engineer (, Mr. Patrick McKiernan) for the project. Mr. McKiernan did not submit the required information, and on April 12, 1996, the permit was *denied*. The use of this well may be a permit violation. Please contact our Springfield Permit Office (1-217-782-1724) and obtain an "As-Built" permit for this improvement.
2. Storage capacity for the supply consists of a 100,000 gallon elevated tank. A 10,000 gallon hydropneumatic storage tank exists at the wellhouse but is only used as a control vessel for the automatic pressure switch. Average daily pumpage in 1999 was 155,618 gallons. The minimum storage capacity (or equivalent capacity) for systems not providing fire protection shall be equal to the average daily consumption. Install a minimum additional 56,000 gallons of storage, in accordance with **Section 7.0.1 of the Recommended Standards for Water Works**. Additional storage (beyond the 56,000 gallons required by the public water supply regulations) may be required to meet fire protection requirements.
3. The facility has "flush valves," (gate valves on the end of uncapped water mains) that discharge below ground. These are cross-connections, since water remaining in the portion of the main behind the gate valve will be unpotable. At all locations where these "flush valves" are located, install flushing devices which discharge above the ground surface and provide a velocity of at least 2.5 feet per second in the water main being flushed, in accordance with **35 IL. Adm. Code Section 607.104 and Section 8.1.6 of the Recommended Standards for Water Works**.
4. A portion of the distribution system along Gregg Drive and Balley Road terminates in a dead-end. Due to aesthetic complaints and low chlorine residuals the supply has run a pipe from the dead-end, under Gregg Drive, ending in a constant flush open discharge approximately one-foot above a channel of the Fox River. This "constant flush valve" is only a *temporary* solution and is a cross-connection. If the level of the river rises, the end

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of this pipe will be submerged. If the pipe is submerged, and low or negative pressure occurs in the distribution system, unpotable water could be back-siphoned into the system **(35 IL. Adm. Code Section 607.104)**. Remove the flush hydrant and properly tie in the dead-end such that a loop is formed with the distribution system, in accordance with **Section 8.1.6 of the *Recommended Standards for Water Works***.

In the interim, contact our Water Pollution Control Section at 1-217-333-0447 and verify if a National Pollutant Discharge Elimination System (NPDES) Permit is required for the existing discharge **(35 IL. Adm. Code, Section 653.113)**.

5. On May 17, 2000, Mr. Chris Johnston and Mr. Manny Abad of this Office observed flushing of facility hydrants due to a Illinois Commerce Commission visit. The hydrants were flushed through 2½-inch nozzles. Hydrants must provide a velocity of at least 2.5 feet per second in the water main being flushed. The facility should verify this rate is being obtained, and if necessary, flush through each hydrant's 4½-inch pumper nozzle, in accordance with **Section 8.1.6 of the *Recommended Standards for Water Works***.
6. The water system has no dedicated auxiliary power supply. Auxiliary generators capable of operating well and chemical treatment pumps or connections to at least two independent public power sources are necessary to provide water pressure during a power outage. At the time of inspection it was reported the supply has portable generators; however, the facility does not have any automatic system alarms and the may lose pressure before the generators could be connected. Provide dedicated auxiliary power as required by **Sections 2.6 and 3.2.1.3 of the *Recommended Standards for Water Works*** (note: if an auxiliary generator is installed, see *Recommended Standards for Water Works* for protection of the water supply from fuel storage or fuel line location).
7. Illinois Commerce Commission flow tests have shown pressure at the following hydrants falls below 20 psi when opened: 25, 20, 19, 16, 14, 9, 8, 7, and 6. Please notify this office (1-847-608-3131) and issue a boil-order when these hydrants are flushed, and whenever distribution pressure drops below 20 psi, in accordance with **35 IL. Adm. Code, Section 607.103**. An answering machine is operational during non-working hours. In addition, distribution systems shall be designed to maintain a minimum pressure of 20 psi measured at the ground surface in all parts of the system under fire-fighting demand or other similar emergency operating conditions **(35 IL. Adm. Code, Section 653.106)**. Any future design of the system should take these flow tests into account.

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8. Maintain the finished water fluoride ion concentration within the required range of 0.9 milligrams per liter (mg/L) to 1.2 mg/L. In the last 12 months four samples have shown levels both above and below the 0.9 to 1.2 mg/L range. In addition, the operator's tested results show an average 0.25 mg/L discrepancy from the Laboratory tested results.

Supplemental fluoridation and natural fluoride levels need to be tested and carefully monitored to verify the correct fluoride dosage, and the fluoride test kit must be either correctly calibrated or replaced with an Agency approved model (**35 IL. Adm. Code, Sections 611.125, 653.501, and 653.701, and Act 40/7a. of the Illinois Compiled Statutes**).

9. Well #2 (ID 20151) does not have a smooth-nosed sampling tap. Smooth-nosed sampling taps are necessary so that representative water samples for bacteriological and chemical analyses can be collected directly from the well. Although the well has a "faucet" type tap, a smooth nose sampling tap is necessary in that this type of sampling tap is easier to keep clean and less likely to harbor bacteria. Install a smooth-nosed sampling tap, in accordance with **Section 2.10 of the Recommended Standards for Water Works**.
10. The following wells do not have air lines or other ways of measuring / monitoring water levels:

- A. Well #2 (ID 20151).
- B. Well #3 (ID 01145).

The level of water in a well can decline because of over pumping, seasonal variation, or changes to the aquifer's characteristics. Since rapid changes rarely occur, records of the water level in a well can be used to anticipate problems before they create a hardship on the community. Install air lines or other ways of measuring / monitoring the water levels at well #1 and well #2, in accordance with **Section 3.2.7.6 of the Recommended Standards for Water Works**. Once air lines are installed, the supply should test the static water levels and pumping water levels at least once a month and report these values on the daily operating reports.

11. The top of the casing for well #2 (ID 20151) is not tightly sealed. This opening could allow dust, dirt, insects, etc. to enter the well and contaminate the water bearing formation. Tightly seal the opening at the top of the casing in accordance with **Section 3.2.7.4 of the Recommended Standards for Water Works**.

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12. At the time of inspection the chlorine residual in the phosphate solution was unknown. Please note that stock phosphate solution must be disinfected by carrying 10 milligrams per liter (mg/L) free chlorine residual. This is necessary to prevent bacterial or other growths developing in the solution. Maintain a free chlorine residual of at least 10 mg/L in the phosphate solution as required by **35 IL. Adm. Code Section 653.202 and Section 4.6.5 of the Recommended Standards for Water Works.**
13. The following refers to the 100,000 gallon elevated tank:
 - A. The ladder for the 100,000 gallon elevated tank does not have a ladder guard. Ladder guards must be provided for the safety of employees who access the tank. Install a ladder guard or other device to ensure the safety of workers, in accordance with **Section 7.0.12 of the Recommended Standards for Water Works.** Comply with all Illinois Department of Labor and Occupational Safety and Health Act regulations.
 - B. The overflow for the elevated tank does not have a splash pad. A splash pad must be provided in order to prevent overflow runoff from eroding the foundation of the tank. Install a splash pad under the overflow such that the bottom of the overflow pipe is at least 12 but not more than 24-inches above the top of the splash pad, in accordance with **Section 7.0.7 of the Recommended Standards for Water Works.**
 - C. At the time of inspection the grass around the wellhouse and elevated tank overflow was very high. All overflow pipes for storage tanks shall be located so that any discharge is visible. Maintain the grass at a sufficient height such that overflow discharge from the elevated tank is visible, in accordance with **Section 7.0.7 of the Recommended Standards for Water Works.**
14. The 10,000 gallon hydropneumatic tank does not have bypass piping. Bypass piping is necessary to permit operation of the water system when the tank is out of service for maintenance or repairs. Install bypass piping for the hydropneumatic tank, in accordance with **Section 7.2.3 of the Recommended Standards for Water Works.**
15. The following refers to permits:
 - A. Please note, in accordance with **35 IL. Adm. Code, Sections 652.101 and 653.115,** construction permits shall be obtained by the official custodian of a

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community water supply prior to all alterations, changes or additions to an existing community water supply which may affect the sanitary quality, mineral quality or adequacy of the supply. This includes: *replacement of well pumps which have become inoperable*, replacement of water main, and the installation or relocation of all treatment chemicals. Please call our permit section at 1-217-782-1724 with any questions.

- B. Please note the Agency may issue construction and operating permits by telephone (1-217-782-1724), in accordance with **35 IL. Adm. Code, Sections 652.301 and 602.104**, if emergency conditions exist which threaten the safety or adequacy of the water supply.
16. The supply submitted all of the daily operating reports for each month of 1999 in May 2000. Please note that daily operating reports must be submitted *monthly*. Submit copies of the daily operating reports within 30 days of the end of each month, in accordance with **35 IL. Adm. Code 653.605**. *The Agency has requested submitting the daily operating reports monthly since October 19, 1990.*

RECOMMENDATIONS AND SUGGESTIONS:

17. The supply has no low water or power outage alarms. Currently, users notify the supply when pressure is low (lost). By the time pressure has dropped enough to be noticed by users, an emergency situation will have already developed. Alarms should be installed to inform the operator of low water and power outage situations *before* emergency situations develop. In addition, the supply should thoroughly investigate all low pressure problems as they occur.

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